Records of the Australian Museum (1993) Vol.45: 11–24. ISSN 0067-1975

Deep Sea Crabs of the Tasman Seamounts (Crustacea: Decapoda: Brachyura)

B. RICHER DE FORGES

ORSTOM,
BP A5, NOUMEA cedex, New Caledonia

ABSTRACT. This study of a collection of deep sea crabs from the Tasman Sea contains eleven species, of which five are new: *Halicarcinus lucasi, Macropodia trigonus, Leptomithrax depressus, Kimbla franklini, Pugettia tasmanensis.*

RICHER DE FORGES, B., 1993. Deep sea crabs of the Tasman seamounts (Crustacea: Decapoda: Brachyura). Records of the Australian Museum 45(1): 11–24.

The collection of crabs in this study come from an Australian Museum cruise in May 1989 on board the RV *Franklin*, a CSIRO vessel. Part of the material from the cruise has already been the object of publications with the description of new material, *Sphenocarcinus lowryi* Richer de Forges, 1992, and a new genus (in press).

The zone explored is situated in the north-western Tasman Sea, the southern Coral Sea, and along the east coast of Australia. Most of the dredging, using an epibenthic sledge, took place in the upper bathyal zone, between 1600 and 120 m. One of the objectives of this exploratory cruise was the sampling of the guyots aligned from north to south between 21°S (Chesterfield Islands) and 38°S. These guyots came from a volcanic hot spot, and are evidence of the movement towards the north of the Indo-Australian plate (Van der Linden, 1969, 1970; Slater & Goodwin, 1973); the oldest date from 28 M.Y. (Oligocene). Their small size and the huge oceanic distances which separate them make these guyots into oases of bathyal fauna in the middle of an immense desert of abyssal depths.

The small collection studied here contains eleven species, each represented by a small number of specimens. Five new species are described. The great originality of this fauna shows that the sampling of the bathyal zone is far from satisfactory.

All material is lodged in the Australian Museum, Sydney (AM) or the New Zealand Oceanographic Institute, Wellington (NZOI).

Species List

Homolidae
Latreillopsis aff. *multispinosa* Ihle, 1912
Hymenosomatidae
Halicarcinus lucasi n.sp.
Majidae
Achaeus curvirostris (A. Milne Edwards, 1873)
Achaeus sp.
Macropodia trigonus n.sp.
Leptomithrax tuberculatus Whitelegge, 1900

Leptomithrax depressus n.sp.
Thacanophrys sp.
Kimbla franklini n.sp.
Pugettia tasmanensis n.sp.

Geryonidae

Chaceon bicolor Manning & Holthuis, 1989

Systematic Account

Homolidae White, 1847

Latreillopsis Henderson, 1888

Latreillopsis aff. *multispinosa* Ihle

Fig.1a,b

? *Latreillopsis multispinosa* Ihle, 1912: 211.–Ihle, 1913: 52, pl.4, figs 19-21.
Latreillopsis aff. *multispinosa*.–Guinot & Richer de Forges, 1981: 556, figs 4G, 6B, pl.VII, 2.

Material examined. 1 ovigerous female, 29 x 28.4 mm, AM P39432, Britannia Guyot, Tasman Sea, 28°18.48'S 155°38.62'E, beam trawl, 415 m, 10 May 1989, J.K. Lowry *et al.* on RV *Franklin*, stn 48.

Remarks. This large female specimen presents, with the *Latreillopsis multispinosa* from the Kai Islands, the same differences noted in the material from New Caledonia (Guinot & Richer de Forges, 1981: 556): the merus of pereiopod 4 is armed with three strong spines; the gastric zone carries five long spines and two spinules; and the basis-ischium of pereiopod 4 carries two strong spinules.

This specimen is the only Homolidae collected during the 49 dredgings of this cruise. Other members of this family are known from the Australian coasts. Davie & Short (1989) have recorded: *Latreillopsis bispinosa, L. petterdi, Paromola japonica, Paromolopsis boasi, Homola orientalis, Homolochunia kullar.*

Hymenosomatidae Macleay, 1838

Halicarcinus White, 1846

Halicarcinus lucasi n.sp.

Fig.2a,b

Material examined. HOLOTYPE, female, ovigerous, 2.2 x 2 mm, AM P39429, Taupo Seamount, Tasman Sea, 33°16.85'S 156°09.15'E, 244 m, 2 May 1989, J.K. Lowry *et al.* on RV *Franklin*, stn 8.

Etymology. This species is dedicated to Dr J.S. Lucas who did the most comprehensive work on this family.

Description. Very small species, the adult female only measures 2 mm in width. Flat, circular carapace, slightly depressed, edged with a light rim and with grooves defining the areas.

The rostrum is long and thin, shaped with a single tip slightly curved towards the top at its end, a few bristles on the edges; the rostrum is separated from the rest of the carapace by the rim which surrounds it. Anterolateral edge slightly concave; anterolateral angle not well marked, does not form a tooth; posterolateral and posterior edge make a continuous curve, perfectly circular.

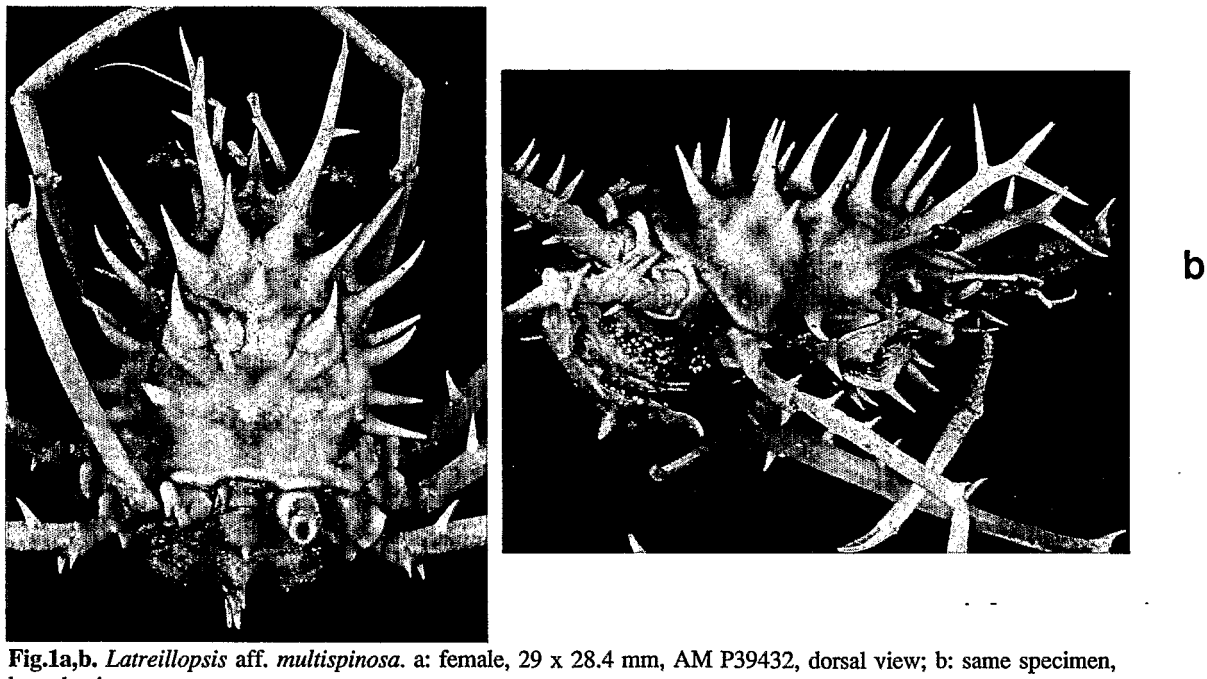

Fig.1a,b. *Latreillopsis* aff. *multispinosa*. a: female, 29 x 28.4 mm, AM P39432, dorsal view; b: same specimen, lateral view.

Gastric area is very wide, separated from the cardiac zone by an overhanging thin plate rising above the cardiac zone. This plate begins at the level of the prebranchial zone and rises progressively; it is widest in its middle and is prolonged by a longitudinal plate on the cardiac zone. Flat branchial and hepatic zones; gastric and cardiac zones slightly bulging. A few bristles on the carapace.

The basal antennal article is short and has several small blunt teeth on its distal edge. The second article is very widened and spread out leaf-like, edged with large spatulate bristles which increase even more its surface. The rest of the antenna is extremely thin and minute; the antennal whip is roughly 1.5 times longer than the second article. The whole of the antenna is shorter than the antennula.

The ocular peduncles are relatively long and present a constriction before the eye which is spherical and pigmented in black. The buccal frame is quadrangular, the third maxillipeds are wide and leave very little space between them; the inner edge of the ischium has long bristles.

The abdomen, very broadened in the ovigerous female, has seven segments.

The chelipeds are shorter than pereiopod 2; the merus is curved and widens distally, it has on its external face a few large bristles. The propodus is swollen and long, the fingers are as long as the rest of the propodus; the fingers have long teeth which mesh together perfectly when the claw is closed.

The ambulatory legs are long and slender, cylindrical in cross-section; the merus of pereiopods 2 to 5 carries strong bristles especially in the distal third; the carpus and the propodus have bristles of varied sizes, some short and crooked, others long and straight; the dactylus which measures two thirds of the propodus is curved and has bristles on its internal edge; the curve of the dactylus of pereiopod 5 is stronger than those of the other pereiopods.

Remarks. The majority of the species of the family of Hymenosomatidae are found in the South-west Pacific, and more particularly around New Zealand and the eastern and southern coasts of Australia. The works of Melrose (1975) and Lucas (1980) have clarified the knowledge of this family. In the key of Lucas (1980), the closest species to *H. lucasi* n.sp. is *H. hondai* (Takeda & Miyake, 1971) which is the only species of the genus *Halicarcinus* to possess a long rostrum. However, *H. hondai* is a littoral species from a reef environment, reported from the Great Barrier Reef. It can easily be distinguished from *H. lucasi* n.sp. by the existence of a tuft of bristles at the end of the rostrum, by the presence of a sharp spine at the anterolateral angle, and by a cornea wider than the ocular peduncle.

Halicarcinus lucasi n.sp. can be distinguished from all other species by the following characters: a simple, very long rostrum curved back towards the top; basal antennal article foliated; the absence of anterolateral tooth; and the presence of a lamelliform plate between the gastric and cardiac zones. The majority of the species of the genus *Halicarcinus* are intertidal and circalittoral while *H. lucasi* n.sp. lives in the upper bathyal zone to a depth of 244 m. Melrose (1975) described a species from New Zealand, *H. tongi* which was taken at a depth of 494 m.

Majidae Samouelle, 1819

Inachinae Macleay, 1838

Achaeus Leach, 1817

Achaeus curvirostris (A. Milne Edwards)

Fig.3a,b

Stenorhynchus curvirostris A. Milne Edwards, 1873: 253.–Haswell, 1882: 2.
Stenorhynchus fissifrons Haswell, 1879: 409.
Achaeus tenuicollis Miers, 1886: 9, pl.1, fig.3a-c.–Whitelegge, 1900: 140.–Rathbun, 1918: 4.

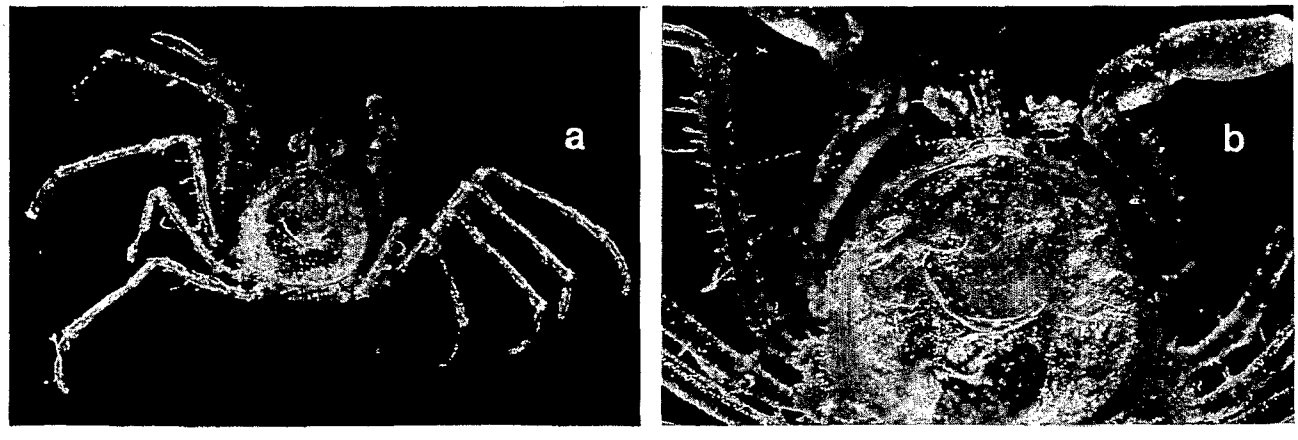

Fig.2a,b. *Halicarcinus lucasi* n.sp. a: female holotype, 2.2 x 2 mm, AM P39429, general view; b: dorsal view.

Achaeus fissifrons.–Griffin & Yaldwyn, 1965: 38-43, figs 1-8.–Griffin, 1966: 38, fig.5.
Achaeus curvirostris.–Griffin, 1974: 4.–Griffin & Tranter, 1986: 9.–McLay, 1988: 118, fig.26.

Material examined. 1 female, ovigerous, 5.4 x 4.5 mm, AM P39424, Gascoyne Seamount, Tasman Sea, 36°43.11'S 156°E, 143 m, 1 May 1989, J.K. Lowry *et al.* on RV *Franklin*, stn 4. 1 male, 4 x 3 mm, AM P40739, Taupo Seamount, Tasman Sea, 33°14.57'S 156°09.59'E, 131 m, 1 May 1989, J.K. Lowry *et al.* on RV *Franklin*, stn 6.

Remarks. This species has been reported several times from the east and south coasts of Australia. The specimens from HMS *Challenger* described by Miers (1886), under the name of *A. tenuicollis* came from stations 161 and 162 situated through 38° to 39°S and 144° to 146°E, that is to say, the same latitude as our collection in Bass Strait. The specimen cited by Rathbun (1918) also comes from Bass Strait, while those of Whitelegge (1900) come from the coasts of New South Wales. This species is also known from North Island of New Zealand.

Achaeus sp.

Fig.4a,b

Material examined. 1 female, ovigerous, 5.6 x 4 mm, AM P40747, Britannia Guyot, Tasman Sea, 28°17.04'S 155°36.46'E, 425 m, J.K. Lowry *et al.* on RV *Franklin*, stn 46.

Remarks. This female specimen, in bad condition, does not match any of the species cited by Griffin & Yaldwyn (1965) or Griffin (1966a; 1970), and according to the key of Griffin & Tranter (1986), it should be placed beside *A. akanensis* Sakai, 1938. This species therefore seems new. Although it is not possible to describe it on the basis of so little material, the principal characteristics are given here.

The rostrum is short and divided into two teeth by a very open V, the rostral teeth end in a spiniform tubercle. The supraocular edge carries a strong spine directed frontwards, followed posteriorly by a smaller spine. The neck is short and very constricted. The carapace, which quickly widens after the neck, has well-defined zones. The hepatic zone is composed of a granulous bulge. The branchial zone has a tooth on its edge and a few tubercles on its mesobranchial part as well as hooked bristles; the metabranchial zone is supplied with a strong spine pointing obliquely towards the outside. The cardiac zone is surmounted by a very long spine with a rounded tip. The gastric zone also has a very long mesogastric spine with a rounded tip and a protogastric spiniform tubercle.

The basal antennal article has two spines, subdistal, pointing ventrally. The epistome is smooth. The first segment of the abdomen has a strong, sharp spine turned toward the back.

The carpus and the merus of the chelipeds are spinular. The dactylus of the pereiopods are long and moderately arched.

Macropodia Leach, 1814

Macropodia trigonus n.sp.

Fig.5a-c

Material examined. HOLOTYPE, female, 4.5 x 3 mm, AM P40740, Taupo Seamount, Tasman Sea, 33°16.85'S 156°09.15'E, 244 m, 2 May 1989, J.K. Lowry *et al.* on RV *Franklin*, stn 8. 1 female, completely crushed, AM P39420, 29°13.20'S 160°35.25'E, 1550 m, 4 May 1989, J.K. Lowry *et al.* on RV *Franklin*, stn 20. 1 female, 7.5 x 5.5 mm, NZOI, Norfolk Island,

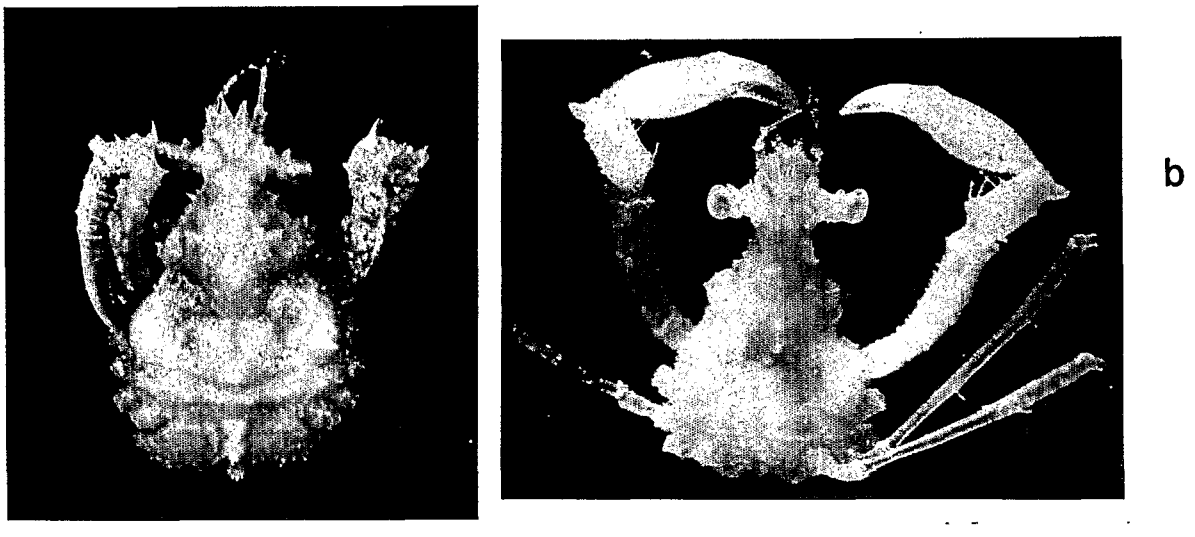

Fig.3a,b. *Achaeus curvirostris*. a: female, ovigerous, 5.4 x 4.5 mm AM P39424; b: male, 4 x 3 mm, AM P40737.

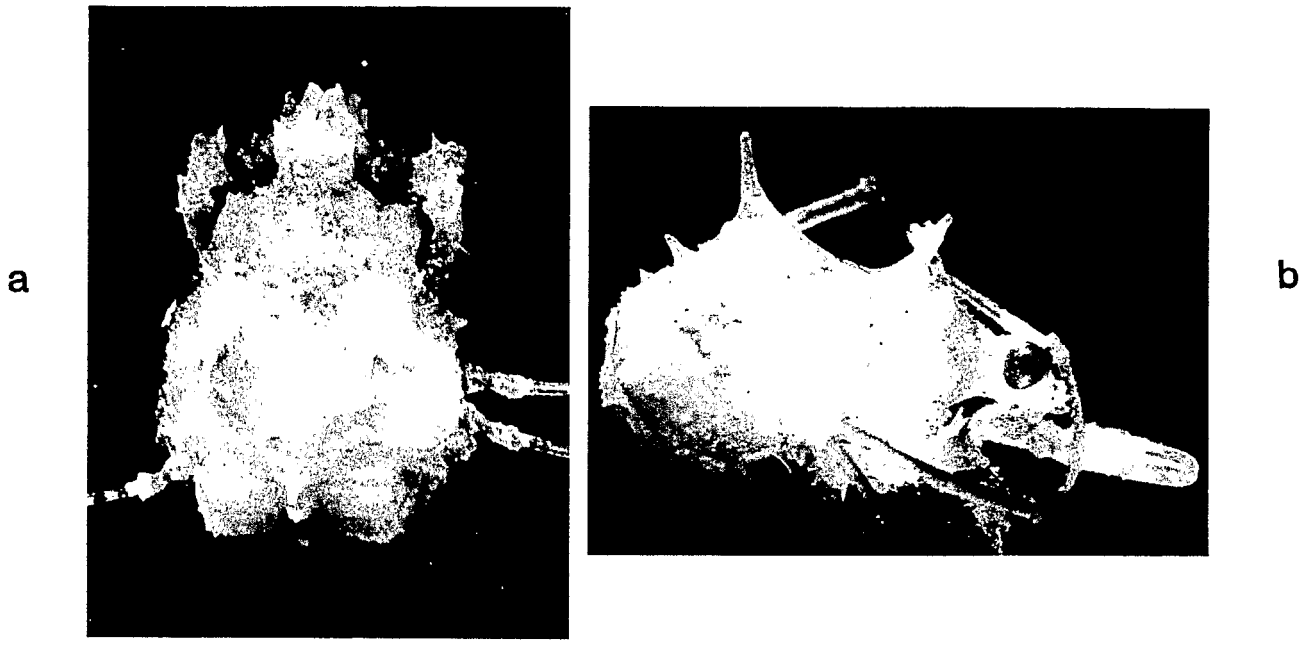

Fig.4a,b. *Achaeus* sp., female, ovigerous, 5.6 x 4 mm, AM P40747. a: dorsal view; b: lateral view.

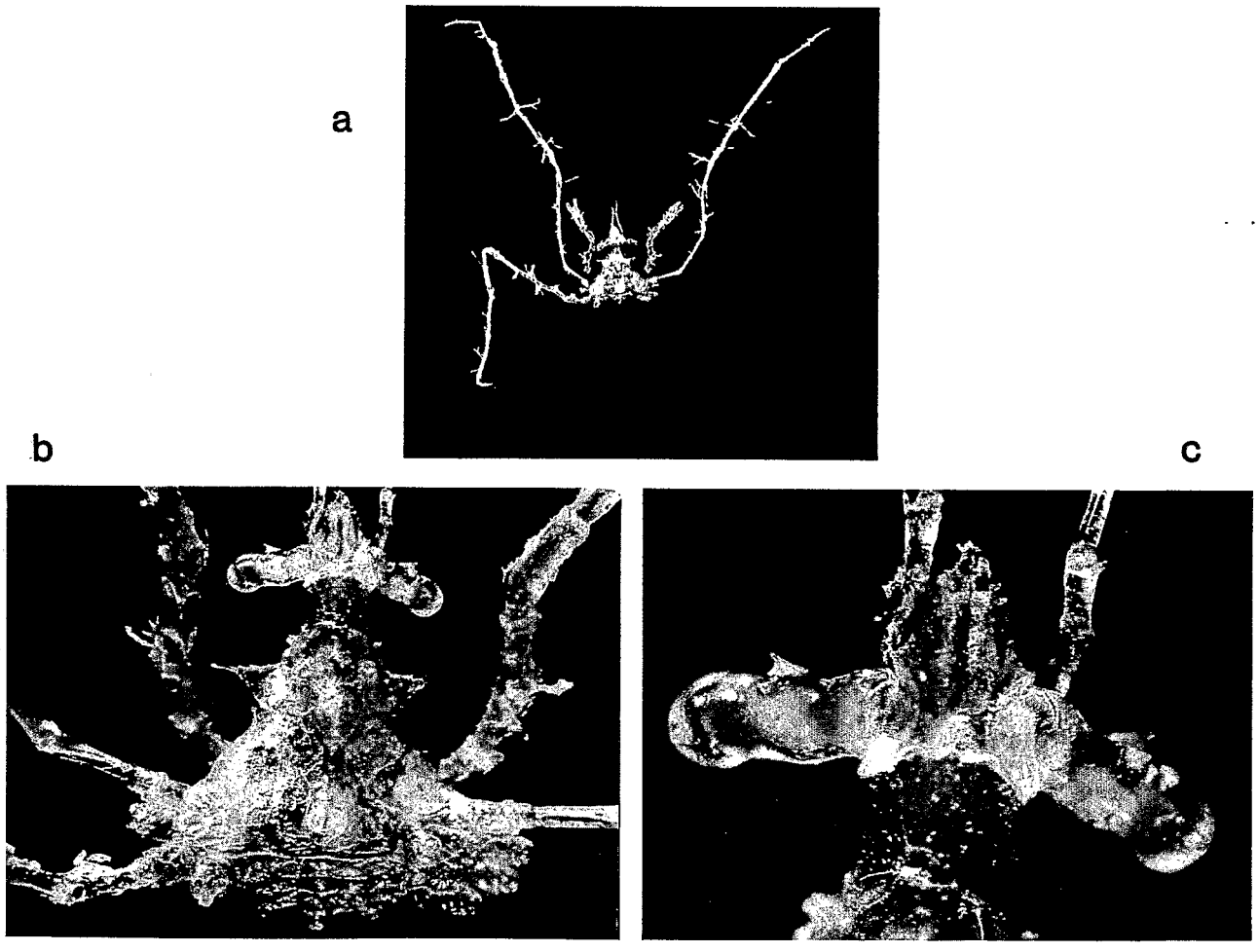

Fig.5a-c. *Macropodia trigonus* n.sp., female holotype, 4.5 x 3 mm, AM P40740. a: general view; b: dorsal view; c: rostrum and ocular peduncles.

29°07.9'S 168°15.0'E, 280 m, stn I 85.

Etymology. By reference to the triangular shape of its carapace.

Description. Triangular carapace having a few strong spines; neck not very extended and long ocular peduncles; pereiopods extremely long and slender, more than five times the width of the carapace.

The rostrum is composed of two short, coupled spines, having a few spinules laterally. The supraocular eave has a single not very sharp tooth pointing vertically, it grows wider anteriorly as it joins the base of the rostrum. The neck is long and thin and has a spine in front of the hepatic zone. The hepatic zone is very prominent and triangular. It has two small spines on its anterior edge, and ends in a point. A groove separates the hepatic zone from the branchial zone. The branchial zone is very wide with well-defined areas; the epibranchial zone has a spiniform tubercle as well as the mesobranchial zone. The cardiac zone, very extensive, has spine standing vertically; this very broad spine seems to be divided longitudinally. The gastric zone, swollen, has a strong mesogastric spine and some protogastric granules.

The basal antennal article, very long and thin, has three spines: one small proximal, one strong median spine, and one small subdistal spine. This article is compressed laterally. The ocular peduncles as long as the neck, have two spines on their upper edge; the cornea is rounded and has a small horn pointing upwards. The epistome is long and bare. The external angle of the buccal frame forms a foliated expansion edged with three spines. The third maxilliped has four spines on its upper face, one on the ischium and three subdistal on the merus.

The female abdomen is short and broad, having three parallel rows of tubercles, one median and two lateral; six segments are visible. The chelipeds, much shorter than the pereiopod (about one quarter), are slender; the merus, of triangular section, has two spines on its upper edge and one spine on its distal end. The carpus is relatively long and has one spine on its upper edge and a small distal spine, its internal edge is slightly carinated and accentuated by a row of strong spines. The propodus is thin and slightly compressed; the fingers of the claw are thin and subparallel, slightly curved back towards the inside of the hand.

The ambulatory legs, pereiopods 2 to 4, are very long and thin; they have hooked bristles. The merus measures about 2.5 times the width of the body; the carpus and the propodus have bristles on their internal edge. The dactylus, equal to two thirds of the propodus is thin and tapering, rectilinear for three quarters of its length with its distal section slightly curved back. Pereiopod 5, shorter than other legs, presents a short falciform dactylus.

Remarks. This splendid species is easily distinguished from those described by its triangular silhouette and its very long pereiopods.

Until now, few species of the genus *Macropodia* were known from the Indo-Pacific. Griffin (1974) reported two species from South Africa: *Macropodia formosa* Rathbun, 1911 and *M. intermedia* Bouvier, 1940. None of them resemble *M. trigonus* n.sp. *Macropodia formosa* does not carry any spines on its basal antennal article while there are three of them in *M. trigonus* n.sp.

In *M. intermedia* the upper distal edge of the propodus of the pereiopods is spinular while it is inermous in *M. trigonus* n.sp.

Griffin & Tranter (1986) cite in the key to the genus for the Indian Ocean the species *Macropodia falcifera* reported by Barnard (1950) from South Africa. This species is characterised by very long rostral spines which differentiate it from *M. trigonus* n.sp. *Macropodia trigonus* n.sp. is thus the first species of this genus reported from the Pacific. Its small size and its habitat in the bathyal zone explain how it has escaped collection until now. The taking of this species at 1550 m at station 20 is strange; it is probably the case of a specimen which remained attached to the dredge net from the previous station.

Majinae Balss, 1929

Leptomithrax Miers, 1876

Leptomithrax tuberculatus (Whitelegge)

Fig.6

Paramithrax tuberculatus Whitelegge, 1900: 146, pl.34, figs 1-2.

Leptomithrax tuberculatus.–Rathbun, 1918: 22.–Bennett, 1964: 53.–Griffin, 1966a: 285.–Griffin, 1966b: 72.–Griffin & Tranter, 1986: 208.–McLay, 1988: 166.

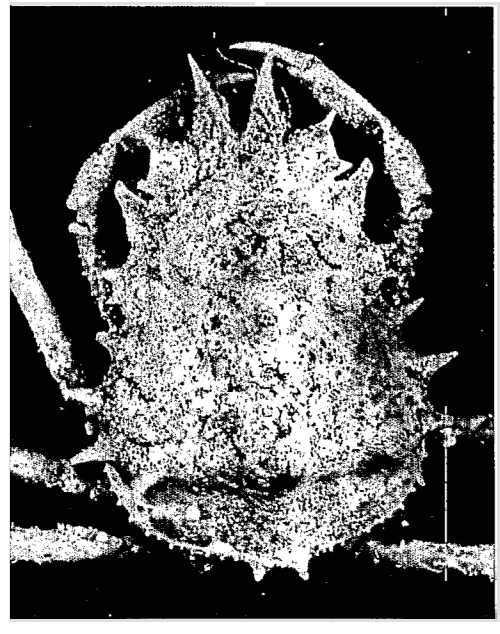

Fig.6. *Leptomithrax tuberculatus;* female, ovigerous, 27.2 x 24 m, AM P40741.

Material examined. 1 female, ovigerous, 27.2 x 24 mm, AM P40741, Gascoyne Seamount, Tasman Sea, 36°43.11'S 156°E, 143 m, 1 May 1989, J.K. Lowry *et al.* on RV *Franklin*, stn 4.

Remarks. This species, described by Whitelegge (1900) from the south-east coast of Australia, has also been taken in waters off Queensland (Rathbun, 1918). Its observed bathymetric distribution is from 20 to 78 fathoms (144 m).

A subspecies exists in New Zealand and in the Kermadec Islands, *L. tuberculatus mortenseni* Bennett, 1964, which presents granular metabranchial and intestinal zones of the carapace, while these are smooth in the Australian species. It has been possible to verify this character from the material preserved in the Wellington Museum.

Leptomithrax depressus n.sp.

Fig.7a-c

Material examined. HOLOTYPE, male, 19.6 x 19.6 mm, AM P39425, PARATYPES, 1 ovigerous female, 16.6 x 16.3 mm, 1 female, 10.8 x 11.1 mm, AM P40742, Gascoyne Seamount, Tasman Sea, 36°43.11'S 156°E, 143 m, 1 May 1989, J.K. Lowry *et al.* on RV *Franklin*, stn 4.

Etymology. By allusion to its very flattened, depressed carapace.

Description. Species of small size, pyriform and very flattened especially in its anterior third; dorsal face entirely covered with large tubercles regularly distributed which do not mask the areas which are well defined; the spines themselves are granular. A few spines on the carapace; the edges are emphasised by very strong teeth The dorsal face carries some scattered hooked bristles, some grouped in tufts on the tubercles of the branchial areas.

Bifid rostrum with two conical sharp spines, short and slightly divergent; the internal face of the rostral spines covered with long hooked bristles. The edges of the carapace carry: two hepatic spines, the anterior spine being the strongest; four very strong conical branchial spines, facing to the outside, the last is the longest and has a more dorsal implantation than the others. These

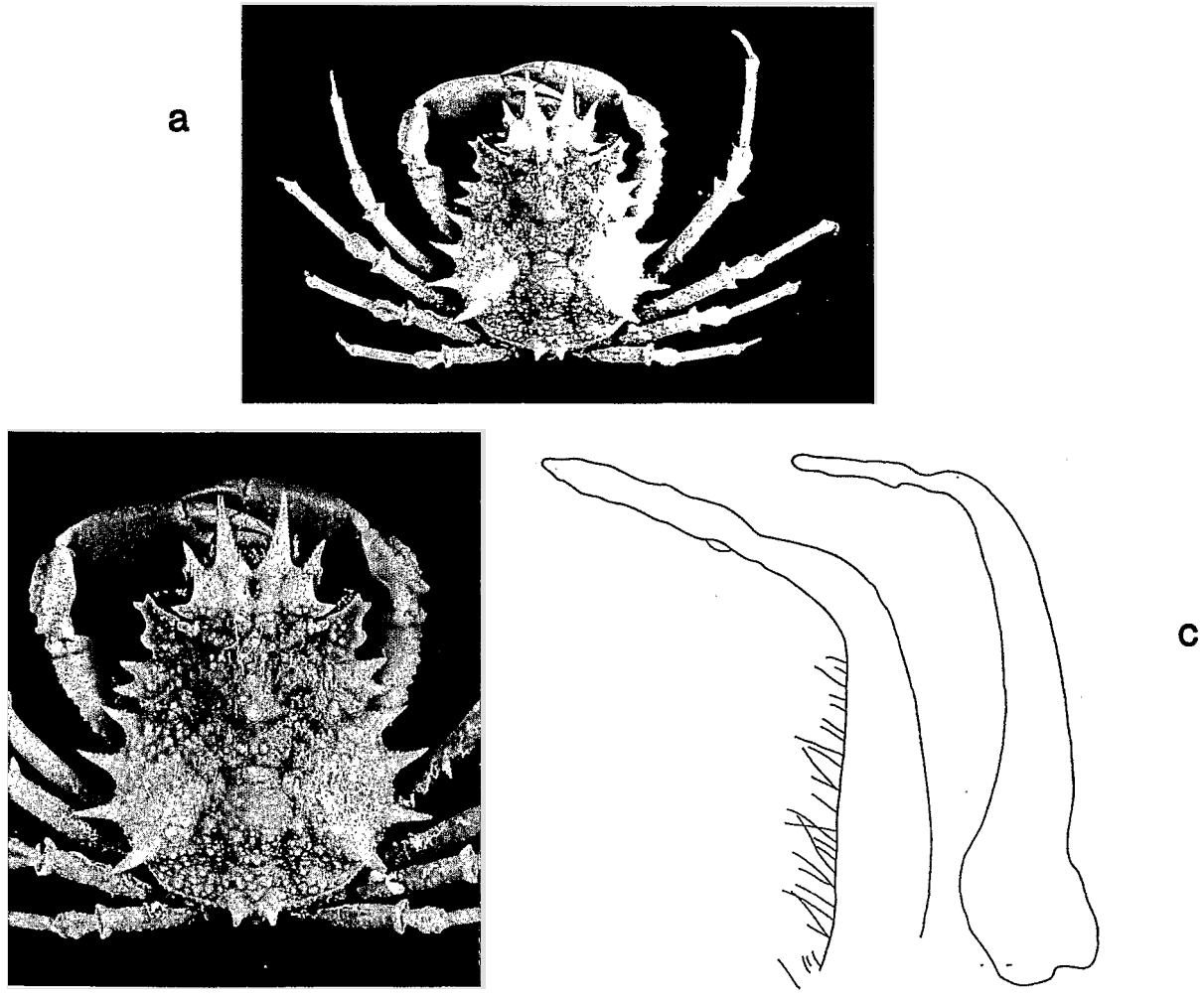

Fig.7a-c. *Leptomithrax depressus* n.sp., male holotype, 19.6 x 19.6 mm, AM P39425. a: general view; b: dorsal view; c: pleopod 1 (length, 3.2 mm).

branchial spines are slightly curved back towards the top at their tip. The posterior edge of the carapace has two short parallel spines pointing backwards.

The dorsal surface has four spines: two on the gastric zone and two on the cardiac zone. On the mesogastric zone, the anterior spine is shorter than the other. One strong spine stands above the cardiac zone which is prominent, and forward of that one there is a small spine.

The orbit is composed dorsally: of a large supraocular eave which ends posteriorly in a foliated spine pointing laterally; of an intercalary rounded spine which rejoins the postorbital spine; of a postorbitary lobe forming a cupel edged with long bristles, divided in two at its extremity and forming a foliated expansion at its posterior edge. The intercalary spine is separated from the supraorbitary edge by a narrow groove and touches the postorbitary spine, it is almost excluded from the orbit. On its ventral face, the orbit is incompletely closed, a broad U-shaped hiatus separate the postorbitary lobe from the basal antennal article.

The ocular peduncles are short, the cornea is wide and topped by a terminal horn. The basal antennal article very developed forms two sharp spines at it upper angles; its ventral face is concave; the spine of its anterior dorsal angle, triangular, is very developed and points towards the front of the animal halfway up to the rostral spine, turned back at its tip, points ventrally. The whole of the ventral face is smooth and punctuated with small holes. The buccal frame is trapezoidal, narrower posteriorly; epistome smooth and depressed.

In the male holotype, the sternum has anterior cavities and longitudinal depressions between each sternite, these depressions grow wider laterally.

The maxillipeds totally cover the buccal frame, the internal edge of the ischium of the third maxilliped with teeth; the ischium is covered with bristles and presents a longitudinal depression; the merus has a concave upper face and an anterolateral angle widened to leaf-shape, the distal edge forms a tooth and a notch.

The chelipeds are short, the propodus is smooth and slightly inflated in the male, the carpus and the merus have their upper face granular. The merus presents an upper edge which is carinated and accentuated with bumps, one spine on the distal edge. The fixed finger of the claw has only one proximal hump which is opposite that of the dactylus. The ambulatory legs are thin and finely granular, pereiopod 2 the longest, the distal edge of the merus from pereiopod 2 to 5 widens forming three blunt teeth. The carpus of pereiopods 2 to 5 is embossed on its external face and presents a longitudinal furrow.

The abdomen is narrow in the male and presents seven segments, the surface of the segments is marked laterally by a hump.

The male pleopod 1 (Fig.7c) is long and thin, globulous at the base, curved back distally and presents a contraction before the opening which is subterminal. The female of 16.6 mm is ovigerous which confirms the small size of this species.

Remarks. The genus *Leptomithrax* has recently been studied by Griffin & Tranter (1986) and according to their key (p.208), *Leptomithrax depressus* n.sp. could be close to *L. bifidus* Ortmann, 1893. This is a Japanese species which lives between 50 to 150 m. However, *L. depressus* n.sp. is easily distinguished from *L. bifidus* by the following characters: there is a single spine on the cardiac zone in *L. depressus* n.sp. and two in *L. bifidus;* in *L. depressus* n.sp. the postorbitary spine is bilobate with a broad foliated expansion, while it is only bifid at its tip in *L. bifidus.*

Leptomithrax depressus n.sp. may be distinguished from all the other species in the genus by its extremely flattened and depressed carapace.

Kimbla Griffin & Tranter, 1986

Kimbla franklini n.sp.

Fig.8a-c

Material examined. HOLOTYPE, male, 6.8 x 4.6 mm AM P39427, PARATYPES, 2 males, 5.7 x 4 mm, 5.2 x 3.8 mm, AM P40743, Taupo Seamount, Tasman Sea, 33°14.57'S 156°09.59'E, 131 m, 1 May 1989, J.K. Lowry *et al.* on RV *Franklin*, stn 6. PARATYPE, male, 7.2 x 4.7 mm AM P39428, Taupo Seamount, Tasman Sea, 33°14.21'S 156°10.68'E, 133 m, 2 May 1989, J.K. Lowry *et al.* on RV *Franklin*, stn 7. PARATYPE, male, 8 x 5.5 mm, AM P40744, Taupo Seamount, Tasman Sea, 33°16.85'S 156°09.15'E, 244 m, 2 May 1989, J.K. Lowry *et al.* on RV *Franklin*, stn 8.

Etymology. This species is dedicated to the boat which collected it, the RV *Franklin.*

Description. Species of small size. Pyriform carapace, ill-defined areas, surface of the carapace covered with small granules. Pseudorostral spines pointed and diverging to a V from their base, longer than one third of the length of the carapace, having bristles.

Supraocular eave scarcely widened and having a strong pointed spine facing to the exterior and upwards; a second spine, shorter and slightly curved is found on the posterior edge of the supraocular eave. The intercalary spine is short and pointed, directed upwards, it is clearly separated from the previous one by a U-shape indentation, this intercalary spine is the same size as the posterior spine of the supraocular eave; the postorbitary spine is very long, wide at its base, and has an extra spine situated in the middle of its posterior edge. The base of the postorbitary spine is hollowed by a cupel which eye may lodged. the notch separating the intercalary spine from the postocular spine is narrow. The hepatic zone, barely distended, has a broad, not very pointed spine and posteriorly a spiniform tubercle. The rounded branchial zone is emphasised on its edge by four metabranchial spines facing towards the back. The gastric zone has a small mesogastric spine and two protogastric ones; these spines are small in size and only slightly acerated. The

cardiac zone is topped by two large spiniform granules and the intestinal zone carries three posterior spines pointing backwards of the specimen, these spines are only moderately sharp and are as long as the metabranchial spines.

The basal antennal article is slightly concave, it carries two strong spines on its distal angles, these spines, slightly curved back, point towards the front. The orbit is wide open ventrally, leaving a globulous eye with a short peduncle visible. The eye carries a spine on its upper face.

The third maxilliped is smooth; interior edge of the ischium accentuated with little teeth (10-12); merus carrying a spine at its internal angle.

Chelipeds slightly shorter than pereiopod 2, merus with spinulous tubercles and a distal spine; carpus with a few tubercles and a distal spine; carpus with a few tubercles and a small proximal spine; smooth propodus and not distended in the male.

Ambulatory legs relatively short and thick-set, of cylindrical section, the merus of pereiopod 2 has a distal spine while on the other legs this spine is reduced; all the articles of the legs carry numerous bristles.

The abdomen has seven segments; the sternal plastron is strongly depressed in its anterior part. Pleopod 1 (Fig.8b) has a sharp end with four strong bristles.

Remarks. The genus *Kimbla* Griffin & Tranter, 1986, contained only a single species described from the upper bathyal zone of New Caledonia. The inclusion of *K. franklini* n.sp. in this genus requires a slight change to the definition. The rostral spines of *K. franklini* n.sp. are longer than those of *K. neocaledonica*. The orbit is slightly different: the supraocular eave has two spines in *K. franklini* n.sp. and three in *K. neocaledonica;* the postocular spine is tapered with an accessory spine in

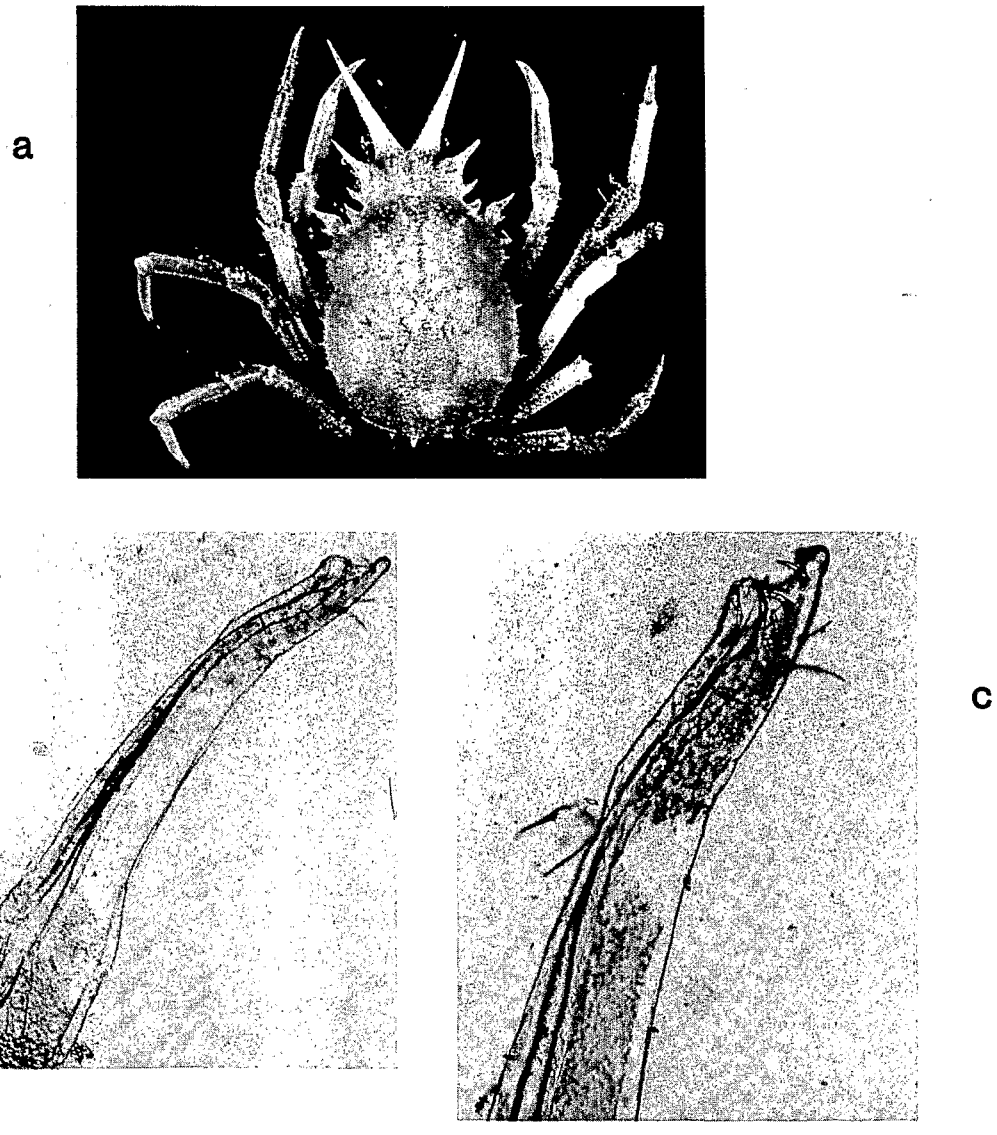

Fig.8a-c. *Kimbla franklini* n.sp., male holotype, 6.8 x 4.6 mm, AM P39427. a: general view; b: pleopod 1 (length, 0.8 mm); c: apex pleopod 1.

K. franklini n.sp. while it is rounded and carries a lateral lobe in *K. neocaledonica*. In the original description, a carapace carrying only granules is mentioned, while the new species carries also spiniform granules and small spines: two hepatic, one mesobranchial, three intestinal, two cardiac, one mesogastric and one protogastric.

Thacanophrys Griffin & Tranter, 1986

Thacanophrys sp.

Fig.9

Material examined. 1 female, 11.4 x 7.2 mm (bad condition), AM P39414, Gifford Guyot, Tasman Sea, 26°43.39'S 159°28.54'E, beam trawl, 295 m, J.K. Lowry *et al.* on RV *Franklin*, stn 38.

Remarks. This small specimen is in a bad condition, the left rostral spine is absent and several spines of the carapace are broken, several legs are missing.

The upper edge of the orbit has two spines; the antorbitary spine is short, slightly curved and indented on its lower edge; the intercalary spine is slender, sharp and indented on its two edges; the postorbitary spine is very long widened at its base with an external edge lamellate; the two hepatic spines are huge and truncate. Two lines of spiniform granules of decreasing size start from the gastric zone and are prolonged on the rostral spines.

The gastric zone, slightly prominent, has two uneven spines, the anterior one being broken at its base on this specimen, the posterior being long and pointing vertically; the cardiac zone has two spines, both broken on this specimen; the branchial zone has two spines (broken on this specimen) and two tubercles topped by a tuft of long hooked bristles; the intestinal zone which carries most probably an uneven spine is completely crushed.

Fig.9. *Thacanophrys* sp., female, 11.4 x 7.2 mm, AM P39414.

The basal antennal article has four long spines, the two external ones protect the ocular peduncle; the cornea is wide and globulous with a strong tooth at its superior face.

On the ventral face, the postorbitary spine presents a lamellate prolongation which borders the orbitary cavity. The upper edge of the buccal frame forms a lamellate crest. The ventral face of the hepatic zone has a lamellate crest which joins the first hepatic spine. The whole of these lamellate crests from the postorbitary spine, from the ventral face of the hepatic zone, from the upper edge of the buccal frame forms a gutter which continues the epistome laterally.

The chelipeds are shorter than pereiopod 2 and slender. The propodus has a crest on its upper edge with a proximal hump; the carpus has two parallel crests consisting of lamellate spines, the proximal spine being the strongest; the merus also has a lamellate crest on its upper edge with two long spiniform expansions on its distal edge.

This species does not correspond to any of those reported by Griffin & Tranter (1986) in their key to the genus *Thacanophrys*. It is probably new and will have to be described using material in good condition.

Pugettia Dana, 1851

Pugettia tasmanensis n.sp.

Fig.10a-c

Material examined. HOLOTYPE, male, 5.1 x 3.6 mm, AM P39426, PARATYPES, 1 male, 5 x 3.4 mm, 2 ovigerous females, 5.2 x 3.8 mm, 5 x 3.8 mm, AM P40745, Taupo Seamount, Tasman Sea, 33°14.36'S 156°09.52'E, 132 m, 1 May 1989, J.K. Lowry *et al.* on RV *Franklin*, stn 5. PARATYPE, male, 5.6 x 3.9 mm, AM P40746, Taupo Seamount, Tasman Sea, 33°14.57'S 156°09.59'E, 131 m, 1 May 1989, J.K. Lowry *et al.* on RV *Franklin*, stn 6.

Etymology. After the location of its collection in the Tasman Sea situated between the south-east coast of Australia and the Lord Howe rise.

Description. Species of small size, the largest ovigerous female measures 5.2 mm. Pyriform carapace, practically smooth with the zones poorly defined, barely spinulous. The carapace and the legs entirely covered with short round bristles giving a squamiform look. Rostrum very short composed of two broad flattened spines opened to a V; the base of the rostral spines forming an eave which masks the basal antennal article. The edge of the rostral spines is less than one fifth of the length of the carapace without rostrum.

The orbit is barely shaped and presents a broad gap between the base of the rostral spines and those of the supraocular eave. The supraocular eave is formed entirely

by a broad flat plate, facing the front; the base of this supraocular dentiform eave joins the postorbitary lobe which is poorly developed and rounded.

The hepatic zone is composed of a broad blunt tooth, flattened dorsoventrally, forming an overhang; below this overhang, the hepatic zone presents a hump topped by three tubercles. Edge of the branchial zone having two blunt teeth, the posterior being the longest; a mesobranchial tubercle lightly marked. Cardiac zone marked by a hump as well as the meso and protogastric zones. The intestinal zone is marked by a posterior rim accentuating the edge of the carapace.

The basal antennal article is wide and its anteroexternal angle ends in a spine. The ocular peduncle is short, the eye globulous with a cornea having two small horns, one forwards, one to the back.

The maxillipeds close the buccal frame completely, the internal edge of the ischium of the third maxilliped is indented. The epistome area is slightly concave. The sternum presents a depression forward of the abdomen, which consists of seven segments. The male pleopod 1 is long and thin, slightly distended at its end and ending in a curved beak (Fig.10b).

The chelipeds are inflated in the male with long lateral extensions in the distal part of the propodus; the fixed finger of the claw has six teeth; the dactylus is curved; the carpus and the merus are embossed and the merus is of triangular section and has a spiniform hump on its upper proximal edge. The walking legs are relatively short and thick-set (pereiopod 2 slightly shorter than the cheliped), the articles are of triangular section. The merus of pereiopod 2 carries three spiniform humps, one proximal, one median, one subdistal, and a large distal hump compressed laterally. The size of the legs decreases

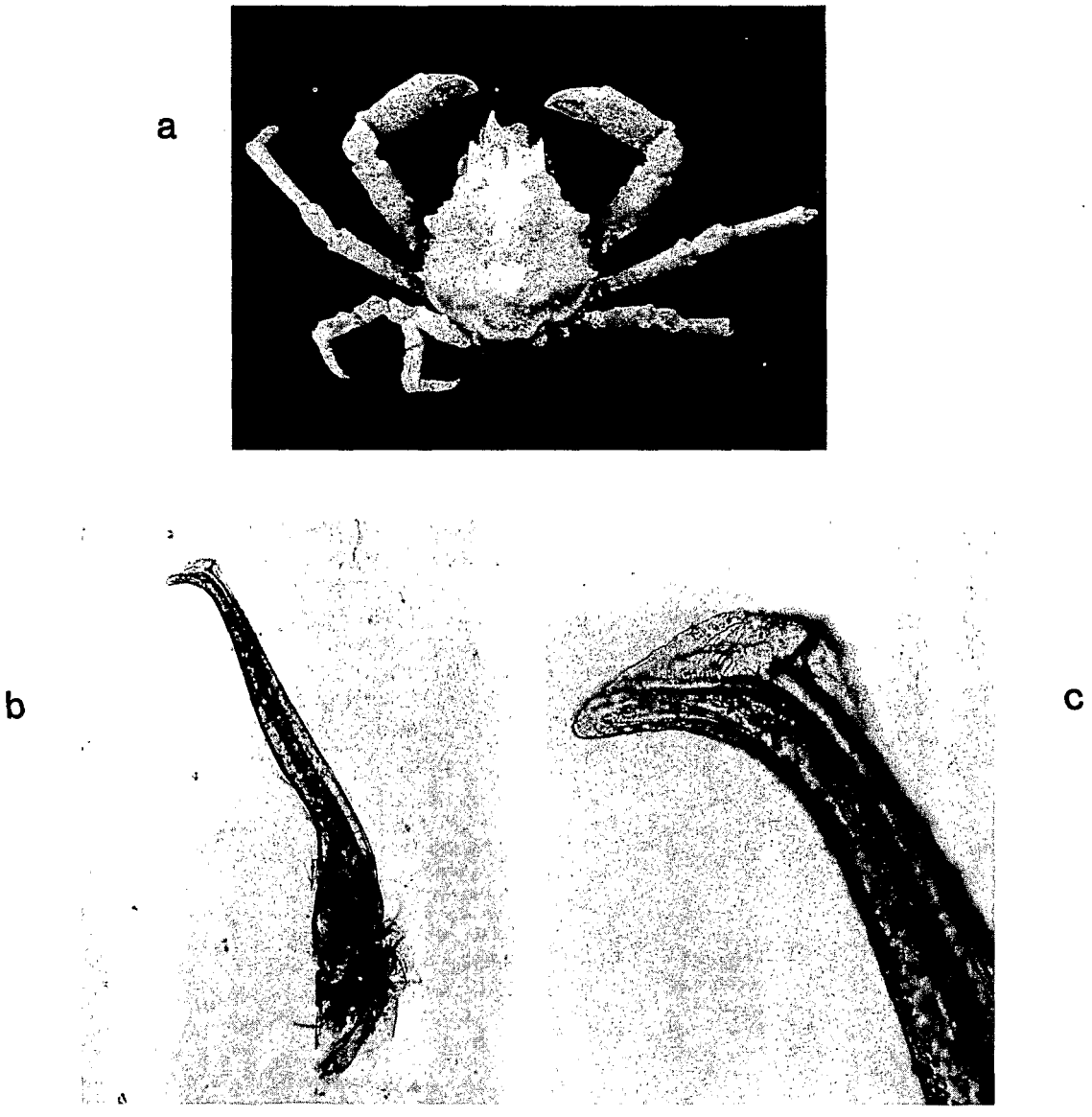

Fig.10a-c. *Pugettia tasmanensis* n.sp., male holotype, 5.1 x 3.6 mm, AM P39426. a: general view; b: pleopod 1 (length, 1 mm); c: apex pleopod 1.

from pereiopods 2 to 5. Pereiopods 4 and 5 which are short and thick have embossed articles and a strong dactylus ending in a hook; the propodus is no longer than the dactylus. The merus of pereiopods 3 and 4 carries only two humps more than the distal hump, the merus of pereiopod 5 has only one, median.

Remarks. It is with some doubt that I place this species in the genus *Pugettia* because the silhouette of its carapace and the shape of its eye, globulous and with two horns, seem to bring it close to the genus *Acanthonyx*. However, the species of the genus *Acanthonyx* are characterised by ambulatory legs modified with subcheliform propodus, which is not the case with *P. tasmanensis* n.sp.

In the genus *Pugettia*, this species is close to *P. quadridens quadridens*, according to the keys given by Sakai (1976) and by Griffin & Tranter (1986). However, *P. tasmanensis* n.sp. is very different from this Japanese species for the following characters: *P. tasmanensis* n.sp. has only one postocular hump while *P. quadridens quadridens* possesses a postocular spine; *P. tasmanensis* n.sp. possesses two spines on its branchial edge while *P. quadridens quadridens* has only one.

Geryonidae Colosi, 1923

Chaceon Manning & Holthuis, 1989

Chaceon bicolor Manning & Holthuis

Fig.11

Geryon affinis.–Griffin & Brown, 1976: 256, figs 7-9.–Sakai, 1978: 9, figs 18,19, pl.2, fig.D.
Geryon quinquedens.–Intes, 1978: 7, figs 5B, 8.–King, 1984: 1986.
Geryon.–Intes, 1978: fig.10.
Chaceon bicolor Manning & Holthuis, 1989: 55, figs 3,4.–Manning, Dawson & Webber, 1990: 604.

Fig.11. *Chaceon bicolor*, male, 41.8 x 61.6 mm, AM P39418.

Material examined. 1 male, 41.8 x 61.6 mm, AM P39418, Lord Howe Rise, Tasman Sea, 29°10.29'S 160°29.78'E, 1509 m, beam trawl, 4 May 1989, J.K. Lowry *et al.* on RV *Franklin*, stn 21. 1 female, 33.5 x 45.7 mm, AM P39421, Lord Howe Rise, 27°38.8'S 161°46.3'E, 1423 m, beam trawl, 6 May 1989, J.K. Lowry *et al.* on RV *Franklin*, stn 31.

Remarks. The specimens described here are small but the male is no longer a juvenile and its pleopods correspond to the description of Griffin & Brown (1976: 270, fig.9).

The spines of the anterolateral edge are sharp and the spines 3 and 5 are the longest; the upper edge of the orbit is rounded, lightly embossed and presents a slight fissure in its middle; the lower edge has a continuous line of small humps, more distinct than those present on the holotype (Manning & Holthuis, 1989: 69, fig.15a).

On these chelipeds, the palm is inflated and the edges of the fingers of the dactylus and of the propodus have triangular teeth; the carpus is granulous on its external face; the merus has two sharp spines, slightly curved, one distal, the other subdistal. The dactylus of the legs from pereiopods 2 to 5 is compressed laterally.

Colour. When alive, the specimens were uniformly orange-red and not bicoloured. In 1989 we collected in our traps many specimens of *Chaceon bicolor* between New Caledonia and Vanuatu, near Matthew Islands (22°20'S 171°23'E) in depths of 800 m (Laboute *et al.*, 1989). Among these samples, some were mauve and others orangey, but none of them presented a bicoloured carapace. It seems therefore that this character of coloration is not a good characteristic of this species.

Behaviour. During dives with the submersible *Cyana*, carried out in the Loyalty Islands and south of New Caledonia, we were able to observe *Chaceon bicolor* in their environment (Richer de Forges & Grandperrin, 1989). They live on muddy bottoms and have been seen near a burrow; this species appears thus to be able to burrow into the sediment, as has been reported for a South African species *C. maritae* by Melville-Smith (1983) and for the American species *C. quinquedens* by Whitlatch *et al.* (1990).

Distribution. This species has been described recently (Manning & Holthuis, 1989) based on material from New Caledonia. It had been reported from the east coast of Australia by Griffin & Brown (1976) and it is not surprising to find it again on Lord Howe Rise. *Chaceon bicolor* has since been reported from Japan to south-eastern Australia and in New Zealand. It lives between depths of 275 and 1600 m depth; it seems that the juveniles live at a greater depth than the adults. This is mentioned by Manning & Holthuis (1989) and confirmed here, our specimen of small size coming from 1509 and 1423 m. In New Caledonia, the adults are abundant between 600 and 800 m.

Discussion

The insufficient sampling of the Tasman Seamounts does not permit the use of these results for biogeographic comparisons. However, we can see that several species collected on Gascoyne Seamount (36°S) and Taupo Seamount (33°S) are known from South Australia and the North Island of New Zealand; this is the case of *Leptomithrax tuberculatus* and *Achaeus curvirostris*. On the other hand, the sampling from Britannia Guyot (28°S) and Gifford Guyot (26°S) brought up different species: *Thacanophrys* sp., *Achaeus* sp., *Latreillopsis* aff. *multispinosa* and also *Sphenocarcinus lowryi* Richer de Forges, 1991. A better sampling of these seamounts and of the ridges of Lord Howe and Norfolk would no doubt allow us to understand the distribution of the temperate and tropical bathyal fauna.

ACKNOWLEDGMENTS. I would like to express my thanks to the following persons: to Dr J.K. Lowry who invited me to participate in a cruise on the RV *Franklin*; to Dr P. Berents of the Australian Museum who looked after the recording of the collections; to Dr J.S. Lucas who gave me his opinion about *Halicarcinus lucasi* n.sp.; to Drs J.C. Yaldwyn and R. Webber who allowed me access to the collections of the National Museum of New Zealand in Wellington; to Dr P. Arnold who helped in drawing pleopods in the Queensland Museum of Townsville. I thank also K. Handley who took the photographs at AIMS.

References

Balss, H., 1929. Decapoden des Roten Meeres. IV. Oxyrhyncha und Sschlussbetrachtungen. **In** Expedition S. M. Schiff: "Pola" in das Rote Meer. nördliche und südliche Hälfe 1895/96-1897/98. Zoologische Ergebnisse XXXVI. Denkschriften der Akademie der Wissenschaften, Wien (math-nat), 102: 1-30.

Barnard, K.H., 1950. Descriptive catalogue of South African Decapod Crustacea (crabs and shrimps). Annals of the South African Museum 38: 1-837.

Bennett, E.W., 1964. The marine fauna of New Zealand: Crustacea Brachyura. New Zealand Department of Scientific and Industrial Researches 153(22): 1-120.

Bouvier, E.L., 1940. Décapodes marcheurs. Faune de France. Lechevalier, Paris 37: 1-404.

Colosi, G., 1923. Una specie fossile de Gerionide (Decapodi brachiuri). Bolettino della Società dei Naturalisti di Napoli, 35 (series 2, vol.15) 37: 248-255.

Dana, J.D., 1851. On the classification of the maioid Crustacea or Oxyrhyncha. American Journal of Sciences and Arts (2) 11: 425-434.

Davie, P.J. F. & J.W. Short, 1989. Deepwater Brachyura (Crustacea: Decapoda) from southern Queensland, Australia with descriptions of four new species. Memoirs of the Queensland Museum 27(2): 157-187.

Griffin, D.J.G., 1966a. A review of the Australian majid spider crabs (Crustacea, Brachyura). The Australian Zoologist 13(3): 259-298.

Griffin, D.J.G., 1966b. The marine fauna of New Zealand: spider crabs, family Majidae (Crustacea, Brachyura). New Zealand Department of Scientific and Industrial Research Bulletin, 172(35): 1-111.

Griffin, D.J.G., 1970. The Australian majid spider crabs of the genus *Achaeus* (Crustacea, Brachyura). Journal of the Royal Society of Western Australia 53(4): 97-119.

Griffin, D.J.G., 1974. Spider crabs (Crustacea: Brachyura: Majidae) from the International Indian Ocean Expedition 1963-64. Smithsonian Contributions to Zoology 182: 1-35.

Griffin, D.J.G. & J.C. Yaldwyn, 1965. A record of the majid brachyuran genus *Achaeus* from New Zealand with notes on the Australian species. Transactions of the Royal Society of New Zealand, (Zoology) 6: 33-51.

Griffin, D.J.G. & D.E. Brown, 1976. Deepwater decapod crustacea from eastern Australia: brachyuran crabs. Records of the Australian Museum 30(11): 248-271.

Griffin, D.J.G. & H.A. Tranter, 1986. The decapoda brachyura of the Siboga Expedition. Part VIII. Majidae. Siboga-Expeditie; monographie XXXIX, C4,148; Brill, Leiden, 335 pp.

Haswell, W.A., 1879. On two species of the genus *Stenorhynchus*. Proceedings of the Linnean Society of New South Wales 3: 408-409.

Haswell, W.A., 1882. Catalogue of the Australian stalk and sessile-eyed Crustacea. Australian Museum, Sydney, 324 pp.

Henderson, J.R., 1888. Report on the Anomura collected by H.M.S. Challenger during the years 1873-1876. Report on the Scientific Results of the Voyage of H.M.S. Challenger during the years 1873-76, 27(1): 1-221.

Ihle, J.E.W., 1912. Über einige neue, von der Siboga-Expedition gesammelte Homolidae. Tijdschrift der Nederlandsche Dierkundige Vereeniging, Leiden (2)12: 206-214.

Intes, A., 1978. Pêche profonde aux casiers en Nouvelle Calédonie et îles adjacentes. Essais préliminaires. ORSTOM, Centre de Nouméa, Rapports Scientifiques et Techniques 2: 1-10.

King, M.G., 1984. The species and depth distribution of deepwater caridean shrimps (Decapoda, Caridea) near some southwest Pacific islands. Crustaceana 47(2): 174-191.

Laboute, P., M. Lardy, J.L. Menou, M. Monzier & B. Richer de Forges, 1989. La campagne "VOLSMAR" sur les volcans sous-marins du sud de l'arc des Nouvelles - Hébrides (N. O. Alis, 29 mai au 9 juin 1989). Nouméa: ORSTOM; Rapport de mission. Science de la Terre. Geologie-Geophysique 11: 1-22.

Leach, W.E., 1814. Crustaceology. Pp. 383-437. **In** Edinbourg Encyclopaedia, Vol.7.

Leach, W.E., 1817-1875. Malacostraca Podophthalmata Britanniae; or Descriptions of Such British Species of the Linnaean Genus *Cancer* as have Their Eyes Elevated on Footstalks. J. Sowerby & B. Quarich, London, 124 pp., 45 pls.

Lucas, J.S., 1980. Spider crabs of the family Hymenosomatidae (Crustacea; Brachyura) with particular reference to Australian species: systematics and biology. Records of the Australian Museum 33(4): 148-247.

McLay, C.L., 1988. Brachyura and crab-like anomura of New Zealand. Leigh. Laboratory bulletin 22: 1-453.

Macleay, W.S., 1838. Invertebratae. Vol.2. Pp. 1-75. **In** A. Smith, Illustrations of the Zoology of South Africa. 5 vols. Smith Elder. London.

Manning, R.B. & L.B. Holthuis, 1981. West African brachyuran crabs. Smithsonian Contributions to Zoology 306: 1-379.

Manning, R.B. & L.B. Holthuis, 1989. Two new genera and

nine new species of geryonid crabs (Crustacea, Decapoda, Geryonidae). Proceedings of the Biological Society Washington 102(1): 50-77.

Manning, R.B., E.W. Dawson & W.R. Webber, 1990. A new species of *Chaceon* from New Zealand (Crustacea: Decapoda: Geryonidae). Proceedings of the Biological Society Washington 103(3): 602-607.

Melrose, M.J., 1975. The marine fauna of New Zealand: Family Hymenosomatidae (Crustacea, Decapoda, Brachyura). New Zealand Oceanographic Institute Memoirs 34: 1-123.

Melville-Smith, R., 1983. Abundance of deep-sea crab *Geryon maritae* in south west african waters from photography. South African Journal of Marine Science 1: 123-131.

Milne Edwards, A., 1873. Descriptions de quelques crustacés nouveaux ou peu connus provenant du Musée de M.C. Godefroy. Journal du Musée Godefroy 1(4): 253-264.

Miers, E.J., 1876. Catalog of the Stalk- and Sessile-eyed Crustacea of New Zealand. Janson, London, 36 pp.

Miers, E.J.,1886. Report of the Brachyura collected by H.M.S. "Challenger" during the years 1873-76. **In** Report on the Scientific Results of the Voyage of H.M.S. "Challenger" during the years 1873-76, Zoology, Part 49, vol.17. London, Edinburgh and Dublin. 362 pp.

Ortmann, A.E., 1893. Die Decapoden-Krebse des Stassburger Museums. VI-VIII, Brachyura (I-II). Zoologische Jahrbücher Jena (Abteilung für Systematik) 7: 23-88, 411-495.

Rathbun, M.J., 1911. The Percy Sladden Trust Expedition to the Indian Ocean in 1905: Marine Brachyura. Transactions of the Linnean Society London (Zoology) ser. 2, 14(2): 191-261.

Rathbun, M.J., 1918. Report on the Spider Crabs obtained by the F.I.S. "Endeavour" on the coasts of Queensland, New South Wales, Victoria, South Australia and Tasmania. Biological Results of the Fishing Experiments carried on by F.I.S. "Endeavour" 1909-14. Sydney V(1): 1-29.

Richer de Forges, B., 1991. A new species of *Sphenocarcinus* A. Milne Edwards, 1875 from Tasmantid guyots, *S. lowryi* n.sp. (Crustacea, Decapoda, Brachyura). Records of the Australian Museum 44(1): 1-5.

Richer de Forges, B. & R. Grandperrin, 1989. Plongées en submersible dans les eaux néo-calédoniennes. La campagne "CALSUB" à bord du "CYANA". ORSTOM actualités, No. 26, Novembre-Décembre 1989: 8-10.

Sakai, T., 1938. Studies on the Crabs of Japan, 3. Brachygnatha Oxyrhyncha; Yokendo & Co., Tokyo, pp. 193-364.

Sakai, T., 1976. Crabs of Japan and the Adjacent Seas. 3 Vols. Kodansha Ltd. Tokyo, pp. 773.

Sakai, T., 1978. Decapod Crustacea from the Emperor Seamount Chain. Researches on Crustacea 8 (suppl.): 1-39.

Samouelle, G., 1819. The Entomologist's Useful Compendium; or an Introduction to the Knowledge of British Insects, etc. London, 496 pp.

Slater, R.A. & R.H. Goodwin, 1973. Tasman sea guyots. Marine Geology 14: 81-99.

Takeda, M. & S. Miyake, 1971. Two new hymenosomatid crabs of the genus *Rhynchoplax* from the west and south Pacific. Researches on Crustacea 4/5: 1-9.

Van der Linden, W., 1969. Extinct mid-ocean ridges in the Tasman Sea and in the western pacific. Earth and Planetary Science Letters 6: 483-490.

Van der Linden, W., 1970. Morphology of the Tasman Sea floor. New Zealand Journal of Geology and Geophysics 13(1): 282-291.

White, A., 1846. Notes on four new genera of crustacea. Annals and Magazine of Natural History, Ser. 1(18): 176-178.

White, A., 1847. List of Specimens of Crustacea in the Collection of the British Museum. London, 143 pp.

Whitelegge, T., 1900. Crustacea. Part I. Pp. 135-199. **In** Scientific results of the trawling expedition of H.M.C.S. "Thetis", off the coast of New South Wales in February and March, 1898. Memoirs of the Australian Museum, Sydney IV(2).

Whitlatch, R.B., J.F. Grassle, L.F. Boyer, & R.N. Zajac, 1990. Animal-sediment relationships involving red crabs (*Chaceon quinquedens*) on the southern New England upper continental slope. Pp. 3-5. **In** W.J. Linberg & E.L. Wenner (eds). Geryonid Crabs and Associated Continental Slope Fauna. South Carolina Sea Grant Consortium; Technical Paper No.58, January 1990.

Accepted February 10, 1991